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A Scoping Review of Virtual Focus Group Methods Used in Rehabilitation Sciences

Benjamin Tran
Western University

Bahar Rafinejad-Farahani
Western University

Sheila Moodie
Western University, sheila@nca.uwo.ca

Robin O'Hagan
Western University

Danielle Glista
Western University

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Benjamin Tran[1] , **Bahar Rafinejad-Farahani**[2], **Sheila Moodie**[3,4], **Robin O'Hagan**[4] , and **Danielle Glista**[3,4]

Abstract

Virtual methods for conducting focus group studies are increasingly being used in many fields, including rehabilitation sciences. This is partly due to the current pandemic, and the need for social distancing, however, may also relate to factors such as convenience and practicality. Virtual research methods enable investigators to collect data at a distance from the participant(s) through the use of technology-mediated data collection methods incorporating new tools and technologies. The aim of this scoping review was to identify, synthesize, and present current evidence related to the methods for conducting virtual focus groups. A comparison of asynchronous and synchronous data collection methods was conducted. The objectives, inclusion criteria, and scoping review methods were specified in advance and documented in a protocol. The 40 articles in this review included virtual focus group research conducted in rehabilitation sciences including data collection conducted using both synchronous (22.5%) and asynchronous (77.5%) models and using a defined moderation method. Three modes of focus group discussion were reported including email, chat-based, and videoconferencing; these were facilitated through the various technology platforms reported in the review. Reported barriers and facilitators to conducting virtual focus group research were extracted and summarized. Commonly reported facilitators to virtual focus group research included the ability to recruit participants from diverse geographical locations and the participants' ability to engage at times convenient to them. Both computer literacy and access to technology were reported as common barriers. This review highlighted the need for further research and guidance around virtual focus groups conducted using face-to-face synchronous methods and with younger participants groups.

Keywords

Focus groups, virtual, qualitative methods, scoping review

Introduction

Focus groups are a popular research method for the collection and analysis of qualitative data and are useful for helping researchers obtain a deeper sociological and psychological understanding of participant experience (Krueger, 2014; Merton, 1987). They can be distinguished through their explicit use of group discussion, generally held in familiar, comfortable, and/or non-threatening settings, and guided by a moderator to keep the discussion relevant to the topic. The most commonly used procedures for focus groups were developed by Robert Merton and colleagues where they established two primary roles of the focus group interview: to provide further data for investigating a concrete experience and to obtain responses to a recurrent experience (Vaughn et al., 1996). Traditionally, focus groups gather 10 to 12 participants together in-person to "focus" on a certain topic or issue. A trained moderator facilitates an engaging discussion

[1]School of Health and Rehabilitation Sciences, Western University, London, ON, Canada
[2]Department of Biology, Western University, London, ON, Canada
[3]School of Communication Sciences & Disorders, Western University, London, ON, Canada
[4]The National Centre for Audiology, Western University, London, ON, Canada

Corresponding Author:
Benjamin Tran, School of Health and Rehabilitation Sciences, Western University, 305-5 Jacksway Cres., London, ON N5X 3T6, Canada.
Email: Benjamin.tran@uwo.ca

on the topic with the aim to collectively co-construct knowledge or meaning of the topic during the focus group, which is then analyzed with the purpose of listening and learning (Lloyd-Evans, 2006). Focus groups allow for a social experience, where participants feed off of the group chemistry and dynamics, leading to rich experiential data (Carey & Asbury, 2016; Carey & Smith, 1994; Krueger & Casey, 2015). Various publications provide guidance and best practices for planning, conducting, and analyzing traditional in-person focus group interviews. Agan et al. (2008) offer useful methodological strategies to consider when conducting focus groups in rehabilitation research. One important factor critical to data management and quality is the group size incorporated in the data collection process. Smaller groups with six to eight participants can yield advantages when discussing complex or emotionally charged topics and allow for deeper individual contributions, while larger groups, consisting of 10 or more participants, may draw on a wider range of experiences to add more contributions for less engaging topics. Smaller groups, however, are more easily managed compared to larger groups. Ultimately, focus groups conducted in health and rehabilitation research are a useful method to gather rich, group-specific information, as participants are able to listen and build on the responses of others, revealing insights that may not have emerged from an individual interview (Agan et al., 2008; Krueger & Casey, 2015).

Virtual Focus Groups

The use of virtual methods for qualitative research data collection is an effective means to include target populations whose participation might otherwise by limited by time, distance, and social barriers (Murray, 1997). In alignment with the increased popularity and access to the internet, the use of virtual focus groups for research studies has emerged over the last two decades (Kite & Phongsavan, 2017). Virtual focus groups involve discussions using internet-based communication. They can be conducted through a variety of methods: asynchronously, synchronously, or using a mixed methods approach. Asynchronous methods do not require participant interaction to occur in real time, such as occurring over discussion boards or through email, whereas synchronous methods have participant interactions occurring in real time, such as instant-messaging chat room software or face-to-face (F2F) videoconferencing (Tuttas, 2015). Mixed model virtual focus groups employ a combination of asynchronous plus synchronous methods. The articles extracted for this review employed only asynchronous or synchronous virtual models, with no mixed virtual model studies included in the extraction sample. Asynchronous focus groups give participants flexibility by allowing participants to interpret questions and respond at their own convenience, whereas synchronous focus groups allow for a more free-flowing, conversational discussion and may include a F2F component, providing a closer approximation to traditional in-person focus groups.

In a review by Lathen and Laestadius (2021), online focus group research is discussed as advantageous when it comes to ensuring full and equitable participation for individuals that may otherwise experience barriers to participation. Similarly, and in the context of rehabilitation sciences, virtual research methods can help facilitate greater participation for individuals with disabilities and impairments, and the opportunity to have their voices heard and fully represented in research. There are several additional advantages to using virtual focus groups in rehabilitation sciences including providing: (a) inclusion of patients in quality-of-care research; (b) increased inclusion of hard-to-reach populations; and (c) opportunity for participants to share information they may not feel comfortable sharing in a F2F focus group (Moloney et al., 2003; Thrul et al., 2017; Woodyatt et al., 2016). Virtual focus groups are also thought to be more cost-effective, as they eliminate travel and other incidental costs, such as food or parking fees (Rupert et al., 2017). However, virtual focus groups have some drawbacks, including exclusion of those without internet access or individuals who struggle with digital literacy (Moloney et al., 2003; Rackensperger et al., 2005).

Focus groups without a F2F component can be disadvantaged by a lack of nonverbal cues, such as body language and eye contact; lack of literacy; inability to type; and limited depth in which discussion points are unpacked and addressed by the group due to the delay between responses, thus potentially limiting group synergy. Synchronous groups with an audio-only component may benefit from spoken intonations in conversation, but still lack nonverbal behavioral cues (Carey & Asbury, 2016). Some researchers may express resistance in utilizing virtual methods as a suitable alternative to in-person focus groups with the argument that virtual methods may not effectively capture the central elements, interpretation of nonverbal responses, and group atmosphere and dynamics (Greenbaum, 1998). There is evidence to support that virtual focus groups may generate a larger number of ideas and solutions compared to in-person focus groups, where a larger number of words and interactions is produced (Reid & Reid, 2005). A F2F component in any type of focus group may be important when considering the ability to capture group dynamics and the overall essence of the discussion generated. Due to the rapidly evolving technology required to facilitate virtual focus group research, more research is needed to summarize the evidence and best practices across the various technologies and tools included in current studies.

While there are published guidelines on moderator roles and practices that detail specific duties and considerations that moderators should employ in a focus group, moderator methods should be tailored according to the delivery method(s) used during virtual focus groups (Vaughn et al., 1996). Asynchronous methods involve longer periods of time between posted messages, requiring the moderator to continuously maintain engagement among participants by regularly sending reminder posts and providing discussion summaries to probe further discussion (Ammerlaan et al.,

2017; Koper et al., 2018). Faster-paced synchronous methods require continuous real-time monitoring and may benefit from the use of two or more moderators, who can help manage tasks such as asking follow-up questions, encouraging participants to elaborate on responses, monitoring the group(s), reading responses, and drawing moderators' attention to specific thoughts while the primary moderator focuses on presenting content from the discussion guide (Ramo et al., 2019). Social media platforms (e.g., Facebook) can serve as a readily accessible delivery method for conducting virtual focus groups, as participants are often already familiar with using the technology (Bryen & Chung, 2018). Facebook has been shown to be a feasible data collection approach for asynchronous virtual focus groups, as the interface is optimized to facilitate communication with built-in notification and privacy features, and is a cost-effective way to study large and diverse samples (Thrul et al., 2017).

Study Objectives

As the use of technology-mediated communication becomes commonplace, we see an increasing interest in conducting virtual research including those that use focus group methods. This scoping review article aimed to synthesize the peer-reviewed literature describing virtual focus group methods used in rehabilitative sciences research, considering important methodological variables including sample and group sizing, discussion planning, moderation methods, and technology types and platforms used in data collection. A secondary purpose was to compare and contrast the methods used across asynchronous and synchronous models, considering the reported barriers and facilitators to conducting virtual research.

Study Design

This scoping review was conducted using the Joanna Briggs Institute (JBI) Methods for Scoping Reviews (Aromataris & Munn, 2017). A preliminary search using PubMed, the University of Western Ontario's library database, and Google Scholar found that there were no published systematic or scoping reviews that provided synthesized evidence and guidance around conducting virtual focus group research methods in rehabilitation sciences studies.

Original peer-reviewed research articles published in English on focus groups facilitated virtually (asynchronous or synchronous) and mediated by a moderator(s) were included in this review. Our definition of a focus group study is that it is a group discussion that generates data and facilitates open discussion in a familiar, comfortable, and unthreatening setting (Stewart & Williams, 2005). Our review focused on including studies from the broader field of rehabilitation sciences which we defined as care that can help an individual recover, maintain, or improve abilities they need in their daily life. These abilities can be physical, psychological, and/or cognitive (MedlinePlus, 2018). Mixed method studies were included; however, data extraction was focused specifically on the methods that related to the conduct of the virtual focus group.

A study was excluded if: (a) it only included an in-person focus group study; (b) it did not include the use of a moderator; (c) the study only used one-on-one or single-person interviews; (d) the study topic was outside of the field of rehabilitation sciences; (e) the study was not published in a peer-reviewed journal; and/or (f) it was published in a language other than English.

Methods

Search Strategy

The search strategy was facilitated by a rehabilitation science librarian from the University of Western Ontario, who assisted in the development of the search strategy and provided guidance throughout the development of the protocol. An initial search through MEDLINE was undertaken to identify articles in line with the topic. Keywords from the titles and abstracts of relevant articles were used to develop a full search strategy for EMBASE, CINAHL, SCOPUS, Nursing and Allied Health, and Web of Science (Table 1). The search strategy, including all identified keywords and index terms, were adapted for each database and the searches were undertaken on July 14, 2020. The reference lists of the included articles were also screened to obtain additional articles that met the inclusion criteria. No date-range limit was used. The objectives, inclusion criteria, and methods of analysis for this review were specified in advance and documented in a protocol (Tran et al., 2021).

Evidence Selection

Following the initial search, all identified citations were collated and uploaded into Covidence software (Veritas Health

Table 1. Literature Search Strategy.

Search Terms
('Online' OR 'virtual' OR 'computer mediated' OR 'connected') AND ('focus group*' OR 'discussion group*' OR 'group discussion*' OR 'group interview*')

Note. The same search terms were used for all databases. The operator syntax used between databases differed (ADJ for MEDLINE and EMBASE; W for CINAHL; PRE for Nursing & Allied Health and SCOPUS; and NEAR for CINAHL).
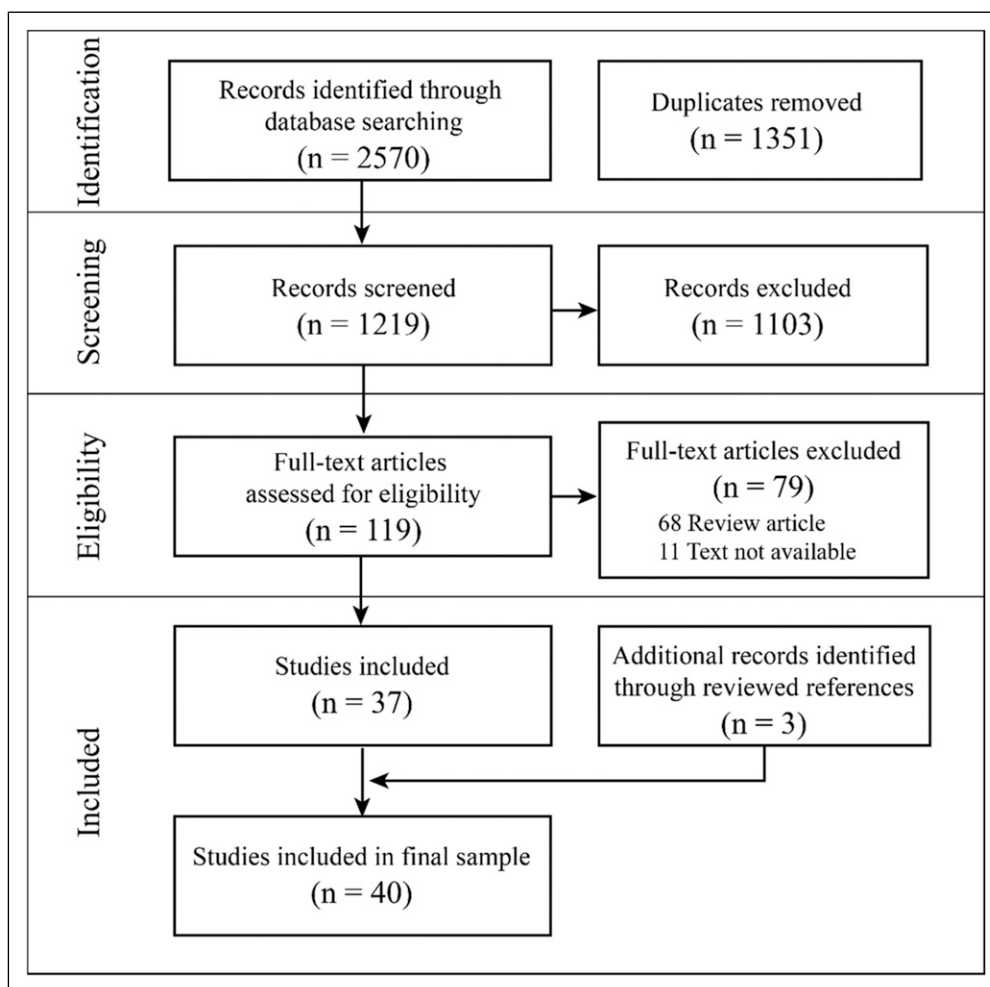
Figure 1. PRISMA flow diagram for article selection.

Innovation, n.d.) and duplicates were removed. Two reviewers (BT, BR-F) independently screened the titles and abstracts to determine inclusion for a full review based on the pre-determined criteria. A team discussion (BT, BR-F, SM, and DG) was held to make final decisions for inclusion when agreement was not achieved between the two initial reviewers. During the second stage of the review process, articles to be screened using a full-text review were retrieved along with their citation details and then screened using Covidence. These articles were assessed to ensure that they met the inclusion criteria. A rationale for excluding sources of evidence at the full-text reading stage was recorded in Covidence. The research team met to discuss articles where consensus for exclusion was not reached and made exclusion/inclusion decisions. Data were extracted into a Microsoft® Excel worksheet. A summary of the included studies is included in Appendix B and the study inclusion process is presented in Figure 1: the Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Review (PRISMA-ScR) flow diagram (Tricco et al., 2018).

Data Extraction

A pilot of the data extraction tool was first conducted by three reviewers (BT, BR-F, and SM); the final version of the tool was put forth following minor modifications completed to achieve a 90% level of agreement amongst reviewers, with respect to content extracted. Data extracted were then completed by two reviewers (BT & BR-F) independently of each other using the final data extraction tool (Appendix A). Data were extracted to describe the following: overall study method(s); reporting practices; analyses; and outcomes with respect to the included participants, contexts, and other key attributes relevant to the scoping review research question. Following the data extraction process, inconsistencies across reviewers were flagged and corrected with input from the entire research team.

Results

Search Results

A literature search of MEDLINE, EMBASE, CINAHL, SCOPUS, Nursing & Allied Health, and Web of Science

generated 1219 citations. A total of 1351 duplicates were removed automatically using Covidence. Of the 1219 articles, 1103 were excluded after screening the titles and abstracts using the inclusion criteria, resulting in 116 articles for full-text review. Most studies excluded at this stage were excluded based on the following criteria: (a) did not conduct a focus group using virtual methods, (b) were unrelated to the rehabilitation sciences, or (c) were not peer-reviewed. During the next stage of the review process, 116 full-text articles were screened, and 79 articles were excluded. These excluded articles included 11 articles that the research team were unable to access and 68 articles where the research methods were not presented in the form of an original research article. This process resulted in 37 articles to be included in the data extraction stage. As an additional step, the research team screened through the reference list of the included 37 studies, yielding three additional studies. A total of 40 studies were included for data extraction. The title of the included articles, corresponding authors, year of publication, virtual model (i.e., asynchronous vs. synchronous), discussion modality (coded according to technology type and platform), moderation details, and details regarding the participant sample included across focus groups are available in Appendix B.

Summary of Included Studies

Of the 40 included studies, 19 studies mentioned the inclusion of additional data collection methods in conjunction with conducting a focus group(s); this is referred to as a mixed methods approach in the data extraction table in Appendix B. Of these 19 studies, 12 used only qualitative methods, such as individual interviews, and seven included quantitative methods, such as surveys or card-sorting tasks. Almost all studies ($n = 39$) labeled the focus group aspect of their study as a "focus group," while one ($n = 1$) study used the term "discussion group." Thirty-one studies used asynchronous methods to conduct the focus groups and nine were conducted synchronously.

Use of a Discussion Guide

Most studies included in this review ($n = 30$) mentioned the use of a discussion guide to facilitate the focus group(s), while the remaining 10 did not specify if a discussion guide was used or were unclear. For the studies that used a discussion guide, 11 stated that questions were developed based on a literature review relating to the study topic, five were based on the results of a previous research, three mentioned gathering clinical or other applicable experiences to develop the guide, and 14 did not state a methodological approach to developing the guide. Data collection methods included email communication with healthcare providers, patient portals, sensors, and wearable devices. The remaining three studies cited published approaches to developing a focus group discussion guide, including the World Health Organization's (WHO)

Table 2. Focus Group(s) Variables According to Total Number of Studies*.

Variable	N (%)	
	Synchronous	Asynchronous
Participants per group		
2 to 5	3 (7.5)	2 (5.0)
6 to 9	3 (7.5)	18 (45.0)
10 to 12	0 (0.0)	4 (10.0)
13 to 19	3 (7.5)	2 (5.0)
>20	0 (0.0)	3 (7.5)
Not stated	1 (2.5)	2 (5.0)
Number of groups		
1	0 (0.0)	18 (45.0)
2 to 5	4 (10.0)	12 (30.0)
6 to 9	3 (7.5)	1 (2.5)
>10	2 (5.0)	0 (0)

Note. * Numbers were calculated based on the reported maximum number of participants per group or maximum number of groups, in cases where there were a range of numbers. Participants per group ranged from 2 to 2250 and number of focus groups ranged from 1 to 39.

International Classification of Functioning, Disability and Health for Children and Youth (ICY-CY, 2007), and the Survey of User Needs 5 (SUN5; Morris et al., 2013), as well as a tetrahedral model of memory experiments (Jenkins, 1979). This model of memory experiments proposed four questions to consider in a learning situation; in this case, learning from the participants in a focus group: (a) the content to be learned; (b) characteristics of the learner, (c) the nature of the instruction; and (d) the type of assessment used (Rackensperger et al., 2005). These four questions structured the early development of their discussion guide, while additional questions were added through the progression of the focus group to probe for further details (Jenkins, 1979).

Participant Enrollment

When considering methodological characteristics related to participant recruitment, the number of participants in each group (i.e., group size), number of groups, and the age of the participants varied across the virtual studies and methods reviewed. A summary of participant enrollment variables, as reported across asynchronous versus synchronous focus group studies, is reported in Table 2. Results show that smaller group sizes were reported for all types of virtual focus group studies. The majority of asynchronous studies contained six to nine participants per group and ran a single focus group in the study, whereas all synchronous studies conducted more than one group. While nine studies cited the chosen group size or number of groups to be optimal or sufficient to the research being conducted, only three studies cited a rationale for their sample size, stating that six to 15 participants are required to successfully conduct focus group data collection.

The majority of the studies included in this review were specific to adult participants. Specifically, 32 studies (80%) included participants over the age of 18 years, nine of which had a minimum age of at least 30 years of age; two (5%) included participants under the age of 18 years; three (7.5%) included multiple age groups (e.g., children, adolescents, and parents); and three (7.5%) did not specify the age of their participants.

Moderator Methods

When considering the moderator approaches used in virtual research, three studies did not include any details with respect to how many moderators were used to facilitate the data collection process. In addition, comprehensive details around the specific actions taken or guides followed by the moderator(s) to facilitate focus group research were provided by most, but not all studies. Moderator numbers were tallied based on those that had participant interaction. In some studies, secondary moderators were used to support the primary moderator; these numbers were not recorded as part of this review. Common moderator practices reported included the use of discussion probes, pre-determined discussion topics, (occurring at specific time intervals in asynchronous studies), and the use of more informal discussion regulation (as needed-basis). Various asynchronous studies (10%) indicated that moderator-initiated reminder messages, occurring at regular time intervals, were important to engage participants in discussion. Strategies to maintain active discussion are important when conducting virtual rehabilitative focus group research, especially in the context of asynchronous data collection. Caron and Light (2015, 2016) used Stewart and Williams' (2005) guidance to regulate their discussion, including requesting participation, commenting, and adding a probing question, while Dattilo et al. (2008) used Morgan and Krueger's (1998) suggestion of soliciting input or requesting expansions on comments made by participants. To minimize bias, it is recommended that the moderator should avoid influencing or dominating the focus group(s) discussions. Muttiah et al. (2016) used Gaiser's (2008) guidance to "provide adequate leadership for the substance of the group to ensure that participants actively participate in the discussion while not being overly present as to cause influence on the discussion" (p. 344). Minimizing moderator influence is also outlined by Gill et al. (2008) moderator's principles, used by Vasluian et al. (2013). In practice, this involved refraining from rephrasing and evaluating statements and instead repeating comments using the participants own words and providing positive reinforcement through neutral comments and probes.

Considering the group of synchronous focus group studies included, four used two moderators, four incorporated two moderators into the discussion process, and one study did not report on moderator method. Incorporating dual moderators in virtual focus group research was reported to assist with discussion monitoring, frequent probing, troubleshooting of logistical or technical issues, and time management; primary and secondary moderating roles help focus the discussion on that included in the

Table 3. Technology Used for Focus Group Data Collection.

Type and platform	N (%)
Synchronous	**9 (22.5)**
Videoconferencing (F2F)	
Zoom	1 (2.5)
Chat group	
Chatstep	1 (2.5)
Facebook secret groups	2 (5.0)
Itracks	1 (2.5)
Unknown platform	3 (7.5)
Chat group and videoconferencing	
Unknown platforms	1 (2.5)
Asynchronous	**31 (77.5)**
Email	
Listserv	1 (2.5)
Chat group	
Blackboard	1 (2.5)
Facebook secret group	3 (7.5)
Fronter	1 (2.5)
GoPost	1 (2.5)
Itracks	2 (5.0)
Phorum	2 (5.0)
phpBB	2 (5.0)
Research platform	3 (7.5)
Wikispace	5 (12.5)
WordPress	1 (2.5)
Unknown platform	9 (22.5)

Bold is used for heading level 1 and represents the focus group delivery method type (Synchronous vs Asynchronous). Italics is used for heading level 2 and represents the specific platform used within the delivery method type.

guide (Howells et al., 2017; Lynch et al., 2018; Ramo et al., 2019). Four of the asynchronous studies used two moderators, with one of these using three moderators; the moderator method was not reported for one asynchronous study. The majority of asynchronous studies incorporated the use of a single moderator (75%).

Technologies Used

When considering the virtual discussion modality, both technology type and platform were recorded during the data extraction process (Table 3). Three modes of communication were noted: email, chat, and videoconferencing. The chat mode was conducted both asynchronously and synchronously. The term *chat group* was used to refer to discussion(s) that took part in an online platform with group interaction visible to all members in both synchronous and asynchronous models. Email discussion(s) included the use of Listserv, an online email system using an automated delivery of an email loop to facilitate asynchronous discussion. Of the nine synchronous studies included in this review, one study involved only F2F videoconferencing, seven used only a chat platform, and one used both videoconferencing and chat platforms (consisting of two chats groups and two video groups). Of the 31 asynchronous studies, one used email and 30 used a chat platform.

Table 4. Mediating Factors Reported in Virtual Focus Group Studies.

	Synchronous*		Asynchronous	
	Chat-based (N = 8) n (%)	Video-based (N = 2) n (%)	Chat-based (N = 30) n (%)	Email-based (N = 1) n (%)
Facilitators				
Anonymity	3 (37.5)	0 (0)	4 (13.3)	0 (0)
Comfort with technology	0 (0)	0 (0)	5 (16.7)	0 (0)
Data quality[a,b]	1 (12.5)	0 (0)	7 (23.3)	0 (0)
Inclusion of sensitive topics	3 (37.5)	0 (0)	1 (3.3)	1 (100)
Interface control[a]	0 (0)	0 (0)	1 (3.3)	0 (0)
Interface suitability	2 (25)	1 (50)	1 (3.3)	0 (0)
Maintenance of confidentiality	2 (25)	0 (0)	1 (3.3)	0 (0)
Participation convenience	1 (12.5)	1 (50)	17 (56.6)	1 (100)
Physical safety for at-risk populations	1 (12.5)	0 (0)	1 (3.3)	0 (0)
Reduced research costs[a]	0 (0)	0 (0)	2 (6.7)	1 (100)
Reflection/expansion of responses	0 (0)	0 (0)	3 (10.0)	0 (0)
Recruitment of geographically diverse participants[a]	5 (62.5)	2 (100)	14 (46.7)	1 (100)
Recruitment of hard-to-reach populations[a]	2 (25)	2 (100)	4 (13.3)	1 (100)
Security	1 (12.5)	0 (0)	4 (13.3)	0 (0)
Tools/technology accessibility	1 (12.5)	0 (0)	2 (6.7)	0 (0)
Transcription availability[a]	1 (12.5)	0 (0)	1 (3.3)	0 (0)
Barriers				
Comfort with technology	0 (0)	0 (0)	2 (6.7)	0 (0)
Computer literacy	0 (0)	0 (0)	5 (16.7)	1 (100)
Data quality[a,b]	1 (12.5)	0 (0)	1 (3.3)	0 (0)
Delays in participation	0 (0)	0 (0)	3 (10)	0 (0)
Group size	1 (12.5)	1 (50)	0 (0)	0 (0)
Inadequate moderation technique	1 (12.5)	0 (0)	1 (3.3)	0 (0)
Increased research costs[a]	0 (0)	0 (0)	0 (0)	0 (0)
Maintenance of confidentiality (platform limitations)	1 (12.5)	0 (0)	0 (0	0 (0
Parental influence in participant response	0 (0)	0 (0)	1 (3.3)	0 (0)
Scheduling challenges	0 (0)	1 (50)	0 (0)	0 (0)
Tools/technology accessibility	1 (0)	1 (50)	4 (13.3)	1 (100)

Note. *The Synchronous study count is inflated by one due to the use of chat-based groups and video-based groups (Rupert et al.).
[a]Facilitator or barrier to research teams only.
[b]Data quality was reported as both a barrier and a facilitator, depending on moderation method used.

Mediators of Virtual Focus Group Methods

The facilitators and barriers to conducting virtual focus groups were identified through the data extraction tool; these have been tallied in Table 4, according to the type of study and (synchronous vs. asynchronous) and the technology used to facilitate the virtual data collection. Overall, more facilitators than barriers were cited in the reviewed literature. The facilitators of virtual focus group research generally related to the ability to recruit and enroll geographically diverse participants, improved participant privacy, data collection convenience, and recruitment of traditionally hard-to-reach participants. Barriers were noted related to scheduling and moderating conversation of synchronous group, internet requirements, and digital literacy requirements for participants.

One study ran three identical focus group sessions, differing only in the method of delivery in order to determine the differences between the three methods: in-person, synchronous videoconference, and synchronous chat-based studies (Rupert et al., 2017). When comparing the three types, this group found that generally the total cost to run each method was relatively similar, as was the preparation time to run the study and the time required to run the studies.

Privacy, Security, and Confidentiality

It is important to consider the privacy, security, and confidentiality risks that can accompany the use of virtual data collection platforms. In this review, three studies specified steps taken to ensure data privacy. It is possible that other

studies also took steps to protect against data privacy risks; however, they did not clearly define the steps taken to address them. Slev et al. (2017) and Walden and Bryan (2011) required participants to use a pseudonym or anonymous email address to ensure participants anonymity and to ensure confidentiality. Boman et al. (2013) gave participants the option of maintaining anonymity by using an alias during the focus group. Rupert et al. (2017) used a proprietary platform that protected participant privacy and confidentiality, opting against the use of public platforms that did not protect privacy and security, such as Skype or FaceTime. In addition to taking extra precautions, such as those previously mentioned, it is important to inform virtual research participants of any potential risks during the informed consent process. Institutional ethics review boards can help safeguard against and privacy, security, and confidentiality risks, in addition to aligning all research tools/technologies and methods with applicable legislative standards (e.g., Health Insurance Portability and Accountability Act [HIPAA] or Personal Health Information Protection Act [PHIPA] compliant).

Virtual Focus Group Analyses

The most frequently adopted analysis approach in our sample was the Braun and Clarke (2006) method of thematic analysis; this method involves steps such as data familiarization, coding, and thematic analysis (seeking, reviewing, and identifying). Grounded theory, from Strauss and Corbin (1994), was also used by three studies, whereby the analyses and theory development occurred after data collection. Seventeen additional guidelines for conducting qualitative analyses were cited, with 40% of the sample using more than one approach. Additional techniques for reflexivity and minimizing bias were cited, such as Krefting (1991) assessments for trustworthiness and Rose et al. (1995) bracketing technique.

Discussion

We conducted a scoping review of the literature that included 40 studies to synthesize the available evidence on virtual focus group methods used in rehabilitative sciences research, including sample and group sizing, discussion planning, and selection of moderator methods and technologies used for the delivery of the groups. A secondary purpose was to compare specific methodologies used, as they related to the barriers and facilitators across synchronous and asynchronous methods. Our synthesis of these data has contributed to knowledge on how focus group studies differ in their method, both asynchronous and synchronous. Overall, asynchronous virtual focus groups were reportedly used more often than synchronous methods. Results indicated variability in the reported methods and conduct for both discussion types.

The idea that focus groups seem deceptively simple to conduct, and therefore may be misused as a research method, is discussed in the literature (Vaughn et al., 1996). Regardless

of whether they are conducted F2F or virtually, researchers should pay attention to the crucial steps to consider in planning for the conduct of a focus group include: (a) determining the purpose of the focus group, (b) constructing the study guide and moderator roles, (c) establishing the size and number of focus groups, and (d) identifying the location (Vaughn et al., 1996). All studies should aim to follow best practice guidelines in the development, conduct, and data analysis as this serves as a means to achieve rich rigor (Tracy, 2010).

The development of a discussion guide remains an important step when preparing for virtual focus groups. The modifications made to focus group discussion guides should consider the type of group being conducted and the format with which the group is taking place. The research team should also consider the role of the moderator(s) and how information will be shared in the virtual space. For example, this may include the use of screen sharing, collaborative online tools such as polling, and other text-based response choices. It is important for research teams to familiarize themselves with the technology and platforms being used when establishing a discussion guide to facilitate meaningful virtual discussion.

The majority of studies in this review reported facilitators to the virtual focus group method used, specifically when considering the need of rehabilitative research studies. Traditionally, in rehabilitation sciences focus group methods, researchers often cite the inability to recruit participants from groups that are hard-to-reach or those that have health problems, and also report high cancellation rates among this cohort (Tausch & Menold, 2016). Some facilitators found in this review included the ability to recruit hard-to-reach participants and physical safety for at-risk groups (Hastings et al., 2016; Holton et al., 2019; Lynch et al., 2018). The most commonly reported facilitators included convenience and greater ease by the participants to participate, accessibility of the focus group from any location, and the research teams were able to recruit geographically diverse participant populations. The use of an online platform also provides anonymity to participants in non-F2F groups, where participants can use pseudonyms when prompted, which facilitates participant comfort, especially when discussing sensitive topics. There is a need for more research using more synchronous and F2F focus group methods specific to health and rehabilitation sciences, as this review only included two studies that used such methods. The benefit of using a virtual approach to collect data has come to the forefront during the COVID-19 pandemic as physical distancing requirements have limited in-person data collection for researchers worldwide. Further exploration and reporting of virtual data collection completed during the pandemic will help expand knowledge around the mediating factors to virtual research.

While there were reported facilitators associated with virtual focus groups, there were also barriers associated with this method of data collection. Two primary barriers revealed in our scoping review included access to technology as well as technology literacy. When considering technology, primary

cited barriers included limited access to a computer and/or an internet connection; these technologies are minimally required to facilitate access to the platform(s) being used to host the virtual focus group. Further, participants need to be literate and comfortable with using the required technology, enabling participants to follow instructions and engage in a virtual environment (Tuttas, 2015). Facebook was reported to be an effective method for both asynchronous and synchronous chat groups in our sample; in part due to participant familiarity with the platform, its optimization to facilitate communication, offer notification functions for new comments, and ensure privacy with "secret groups" (Bryen & Chung, 2018; Thrul et al., 2017). A variety of virtual platforms were used in this review, especially for asynchronous methods. Not all virtual platforms would meet the ethical considerations of institutional human ethics review boards when considering privacy, security, and confidentiality, perhaps including Facebook; therefore, research teams need to consider these components, along with ease-of-use when choosing a platform.

The role of the moderator(s) and their performed functions are inextricably connected to each aspect of the focus group and thus serve as a central component to the success of a focus group interview (Vaughn et al., 1996). Moderators of asynchronous studies should aim to organize the discussion thread in a way that facilitates readability for participants, and moderators of synchronous studies should enable a consistent flow of conversation, preferably when they have a commonality to the participating group(s). Thrul et al. (2017) noted that a large number of active participants and questions can cause confusion when the order of questions and comments are constantly updating. They addressed this issue by "tagging" participants in specific questions that were difficult to locate. The choice of moderator can have an influence on the focus group, as indicated by two studies (5%) in our sample; these studies recommended some form of commonality between the moderator and the participants when the research team selects the moderator(s) for the focus group(s). Dattilo et al. (2008) included individuals with disabilities on their research team, borrowing this approach from Krogh and Lindsay (1999). Rackensperger et al. (2005) also employed this strategy by selecting a moderator who had personal experience with using an augmentative and alternative communication (AAC) device when studying the experience of individuals who learned to effectively communicate with AAC technology. This decision positively influenced the quality of the focus group discussion, as the moderator was able to "bring personal experiences and insights to the development of the questions used in the focus group script and to the adlibbed questions used to obtain additional information from participants who posted to a discussion" (Rackensperger et al., 2005, p. 166).

Technology should not always be considered a safe and secure method of data collection, as it can be susceptible to software and hardware glitches, as well as data breaches; thus, for studies that include sharing of health information, the platform needs to be compliant with the policies in place that act to protect health privacy (e.g., HIPAA or PHIPA compliant). Rupert et al. (2017) examined common virtual study claims, such as the notion that virtual focus groups provide faster data, as well as reduce participant burden. Although both of these factors were found to be true in their study, it was also noted that research preparation time was the same or longer, when compared to in-person focus groups, with a higher rate of cancellation and no-shows reported virtually.

Three studies in our review acknowledged the lack of nonverbal cues and intonations as a possible disadvantage in the conduct of the study as it related to observing or enabling participants' ability to express their feelings (Dickerson, 2005; Meaux et al., 2014; Vasluian et al., 2013). However, it was noted in one study that participants who seek out these types of studies are familiar with the interactions across the virtual mediums and this does not have to be a barrier to all (Dickerson, 2005). Some researchers argued that asynchronous methods are not suitable alternatives for in-person focus groups, as they lack the sense of participant engagement and immediacy of responses (Matthews & Cramer, 2015; O'Connor & Madge, 2003). While also seen as a facilitator, the ability for participants to reflect and respond to prompts and questions at their convenience creates limitations on capturing spontaneity and reduces conversational flow (Tuttas, 2015). Vasluian et al. (2013) addressed this possible disadvantage in their study by enabling the use of emoticons for participants to express their feelings. In conducting a synchronous study, Howells et al. (2017) addressed this limitation through predetermining precisely phrased questions to ensure clear language and continuity of discussion. The use of videoconferencing tools to facilitate F2F discussion could mitigate the disadvantages related to lack of nonverbal cues as they more closely replicate the in-person focus group experience. Videoconferencing technology allows for immediacy and spontaneity in participant responses, facilitates the role of the moderator, and gives the researcher a deeper look into the quality and extent of participant interaction and engagement through the visual component, factors that are important in rehabilitative sciences research (Tuttas, 2015). Web conferencing technology can present limits on group sizes, or a decline in video and/or audio quality, when conducting larger group sessions; for instance, Skype recommends limiting group size to five (Tuttas, 2015). Two synchronous studies included a F2F component in addition to their virtual data collection method (Gupta & Raja, 2017; Rupert et al., 2017). Rupert et al. (2017) provided information comparing in-person and virtual focus groups with respect to costs, recruitment, and participant logistics. In contrast, Gupta and Raja (2017) study did not provide such comparisons; had there been more focus group discussions that used F2F synchronous methods, it may have been possible to generate more information regarding the potential effectiveness of these tools. The findings of this scoping review will be relevant to researchers

in the rehabilitation sciences who conduct focus groups and are considering the use of a virtual platform.

This review has also highlighted the need for guidance around virtual focus group methods and subsequent reporting requirements. Findings from this review include data coded as "unknown" in the absence of clearly reported methods; these unknown variables were commonly associated with group size, the virtual platform used, and/or moderation methods. Future research should consider whether the methods incorporated are appropriate for virtual research and whether key methodological characteristics have been adequately reported to help guide virtual best practices.

Limitations

In scoping review methodology, a quality appraisal of the included studies is suggested, but not required. In this review, a quality appraisal of the studies was not included; the included studies were not judged for trustworthiness or validity. Although gray literature material is permissible in scoping reviews, we chose to limit our search to academic, peer-reviewed literature, as we assumed during the peer-review process that a quality appraisal of the individual studies would have been a consideration prior to publication.

Conclusion

Virtual focus groups are increasingly gaining momentum and interest in health and rehabilitation sciences. This may be related to the COVID-19 pandemic but may also be related to the perceived and real value in using them. The results of this scoping review found that asynchronous methods were more frequently used in research studies than synchronous. Focus group sizes varied, with an average size between six and nine participants. There are perceived and real advantages and disadvantages to the use of both asynchronous and synchronous methods; researchers are advised to consider these prior to deciding on which approach to use in their research.

There is methodological best practice guidance available for the conduct of focus groups; however, these need to be modified to be more applicable for virtual focus group methods. Researchers who utilize virtual focus group methods are encouraged to clearly document their protocol, data collection, and analysis methods for others to learn from. They are also encouraged to include effectiveness measures so that a better understanding of the effectiveness of virtual focus group methods is known.

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Declaration of Conflicting Interests

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ORCID iDs

Benjamin Tran https://orcid.org/0000-0002-4427-7330
Robin O'Hagan https://orcid.org/0000-0002-0417-7773
Danielle Glista https://orcid.org/0000-0002-1953-3312

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Appendix A

Data extraction tool

Concept/question	Details
Scoping review details	
Title of review	A scoping review of virtual focus group methods used in rehabilitation sciences
Objective(s)	(1) Synthesize the available evidence on methods and procedures used in virtual focus groups, including the selection of delivery modalities and technology used.
	(2) Compare and contrast the methods used as related to the reported benefits and challenges to conducting virtual research
Inclusion criteria	Focus group studies conducted virtually, or as part of a mixed method study, using a moderator, published in English, peer-reviewed, and within rehabilitation sciences
Exclusion criteria	Focus group studies conducted in-person only, and/or without the use of a moderator, not in English, related to a field other than rehabilitation sciences, and non–peer-reviewed literature
Evidence source	Peer-reviewed articles, primary study
Evidence source details and characteristics	
Covidence article number	
Manuscript number	
Citation	Article citation according to APA guidelines
Details/results extracted from source of evidence	
Mixed methods design?	Coded as Yes/No
Type of study	Asynchronous, synchronous, and/or mixed
Research topic of focus group	Described according to methods
Label used to describe data collection type	Include details available
Methodological approach followed	Cite reference, if available
Number of participants per focus group	Described according to methods (*n* per group)
Total number of focus groups conducted	Described according to methods (*n* of groups)
Rationale for group size and number of groups?	Include details available
Concept/question	Details
Modality	
Face-to-face component	Yes/No
Videoconferencing	Yes/No
Telephone	Yes/No
Email	Yes/No
Text messaging	Yes/No
Chat group	Yes/No
Name of software used	Described according to methods
Challenges to using tool(s) identified	Include details available
Advantages to tool(s) identified	Include details available
Describe use of moderators	Indicate number of moderators used and their roles
Notes on quality of group discussion	Add details when available
Analysis approach	Include citation when available
Description of overall efficacy of virtual research	Include details available
Description of reporting method	Include details available
Discussion guide used	Yes/No
Methodological approach for discussion guide	Cite reference and type (e.g., funnel shaped)
Target population age range	Describe according to methods
Special methodological considerations?	Note any special design considerations related to virtual delivery (e.g., the use of emoticons to express feelings, use of pseudonyms to improve confidentiality)

Appendix B

Descriptive data of included studies

#	Title	Authors	Virtual model	Discussion modality	n of group(s)	n per group	Platform name	Mixed methods?	Moderator (n)
1	The "virtual focus group": Using the internet to reach pregnant women on home bed rest	Adler & Zarchin, 2002	Asynchronous	Email	1	7	Listserv	No	2
2	Preferences and needs of patients with a rheumatic disease regarding the structure and content of online self-management support	Ammerlaan et al., 2017	Asynchronous	Chat group	1	35	Facebook secret group	Yes	2
3	Increasing the connectivity and autonomy of RNs with low-risk obstetric patients	Baron et al., 2018	Asynchronous	Chat group	2	7–8	Unknown	Yes	2
4	Adolescents' social needs living with juvenile idiopathic arthritis and their views about digital resources	Beneitez et al., 2020	Asynchronous	Chat group	1	7	iTracks	Yes	1
5	Fathers' encounter of support from pediatric diabetes teams; the tension between general recommendations and personal experience	Boman et al., 2013	Asynchronous	Chat group	4	Unknown	Fronter	Yes	1
6	Towards facilitating change in service delivery: An illustrative example	Boshoff, 2005	Asynchronous	Chat group	5	Up to 7	Unknown	Yes	1
7	Occupational therapy managers' perceptions of challenges faced in early intervention service delivery in South Australia	Boshoff et al., 2005	Asynchronous	Chat group	2	6–7	Unknown	Yes	1
8	Patients' reports of barriers to expressing concerns during cancer consultations	Brandes et al., 2015	Asynchronous	Chat group	2	8	Unknown	Yes	1
9	What adults who use AAC say about their mainstream mobile technologies	Bryen & Chung, 2018	Asynchronous	Chat group	1	8	Facebook secret group	Yes	1
10	My world has expanded even though I'm stuck at home: experiences of individuals with amyotrophic lateral sclerosis who use augmentative and alternative communication and social media	Caron & Light, 2015	Asynchronous	Chat group	1	9	Wikispace	No	1

(continued)

#	Title	Authors	Virtual model	Discussion modality	n of group(s)	n per group	Platform name	Mixed methods?	Moderator (n)
11	"Social media has opened a world of 'open communication:'" experiences of adults with cerebral palsy who use AAC and social media	Caron & Light, 2016	Asynchronous	Chat group	1	9	Wikispace	No	1
12	I Have chosen to live life abundantly: Perceptions of leisure by adults who use AAC	Dattilo et al., 2008	Asynchronous	Chat group	1	8	Phorum	No	1
13	Attractiveness of working in home care: An online focus group study among nurses	De Groot et al., 2018	Asynchronous	Chat group	6	6–8	Research platform[2]	No	3
14	Identifying best practices in dialysis care: results of cognitive interviews and a national survey of dialysis providers	Desai et al., 2008	Asynchronous	Chat group	1	2550	Unknown	Yes	Unknown
15	Technology-patient interactions: Internet use for gaining a healthy context for living with an implantable cardioverter defibrillator	Dickerson, 2005	Asynchronous	Chat group	1	13	Blackboard	Yes	1
16	Expectations of persons with paraplegia regarding their card in India	Gupta & Raja, 2017	Synchronous[1]	Videoconferencing	5–10	2–4	Zoom	No	Unknown
17	The importance of social identities in the management of and recovery from 'Diabulimia': a Qualitative exploration	Hastings et al., 2016	Synchronous	Chat group	5	2–4	Unknown	No	1
18	Childbearing concerns, information needs and preferences of women with cystic fibrosis: An online discussion group	Holton et al., 2019	Asynchronous	Chat group	1	11	Facebook secret group	No	1
19	'When it goes back to my normal I suppose': a Qualitative study using online focus groups to explore perceptions of 'control' among people with eczema and parents of children with eczema in the UK	Howells et al., 2017	Synchronous	Chat group	6	5–7	Chatstep	No	2
20	Exploring childhood cancer survivors' views about sex and sexual experiences-findings from online focus group discussions	Jervaeus et al., 2016	Synchronous	Chat group	39	2–5	Unknown	No	1–2
21	Experiences of Dutch general practitioners and district nurses with involving care services and facilities in palliative care: A mixed methods study	Koper et al., 2018	Asynchronous	Chat group	3	8–10	Unknown	Yes	1
22	A new approach to the measurement of adaptive behavior: Development of the PEDI-CAT for children and youth with autism spectrum disorders	Kramer et al., 2012	Asynchronous	Chat group	1	13	WikiSpace	Yes	1
23	Improving safe use of medications during pregnancy: The roles of patients, physicians, and pharmacists	Lynch et al., 2017	Synchronous	Chat group	6	Unknown	Unknown	Yes	1
24	Making decisions about medication use during pregnancy: Implications for communication strategies	Lynch et al., 2018	Synchronous	Chat group	6	7–9	Itracks	Yes	1

(continued)

(continued)

#	Title	Authors	Virtual model	Discussion modality	n of group(s)	n per group	Platform name	Mixed methods?	Moderator (n)
25	Family-centered services for children with complex communication needs: The practices and beliefs of school-based speech-language pathologists	Mandak & Light, 2018	Asynchronous	Chat group	2	5–8	WikiSpace	No	1
26	Transition to self-management after pediatric heart transplant	Meaux et al., 2014	Asynchronous	Chat group	3	2–6	Itracks	No	Unknown
27	Using internet discussion boards as virtual focus groups	Moloney et al., 2003	Asynchronous	Chat group	4	4–8	Unknown	Yes	1
28	A qualitative study of adult AAC users' experiences communicating with medical providers	Morris et al., 2013	Asynchronous	Chat group	1	4	GoPost	Yes	1
29	Providing instructional support for AAC service delivery in low- and middle-income LAMI countries	Muttiah et al., 2016	Asynchronous	Chat group	1	8	Wikispace	No	1
30	Simultaneous natural speech and AAC interventions for children with childhood apraxia of speech: Lessons from a speech-language pathologist focus group	Oommen & McCarthy, 2015	Asynchronous	Chat group	1	8	phpBB	No	1
31	"The challenge of managing insecurities": Parents' experiences with the care for their child with congenital diaphragmatic hernia	Petit-Steeghs et al., 2019	Asynchronous	Chat group	3	7–12	Research platform[2]	Yes	1
32	"When I first got it, I wanted to throw it off a cliff": The challenges and benefits of learning AAC technologies as described by adults who use AAC	Rackensperger et al., 2005	Asynchronous	Chat group	1	7	Phorum	No	1
33	Exploring identities and preferences for intervention among LGBTQ+ young adult smokers through online focus groups	Ramo et al., 2019	Synchronous	Chat group	2	9–18	Facebook secret group	No	2
34	Exploring winter Community participation among wheelchair users: An online focus group	Ripat & Colatruglio, 2016	Asynchronous	Chat group	1	8	WordPress	No	1
35	Virtual versus in-person focus groups: Comparison of costs, recruitment, and participant logistics	Rupert et al., 2017	Synchronous[1]	Videoconferencing/Chat group	4	8	Unknown	Yes	1
36	Self-management support and eHealth for patients and informal caregivers confronted with advanced cancer: An online focus group study among nurses	Slev et al., 2017	Asynchronous	Chat group	6	Unknown	Unknown	No	1
37	The experiences of gay and bisexual men diagnosed with prostate cancer: Results from an online focus group	Thomas et al., 2013	Asynchronous	Chat group	1	10	Research platform[3]	No	1
38	Conducting online focus groups on Facebook to inform health behavior change interventions: Two case studies and lessons learned	Thrul et al., 2017	Synchronous	Chat group	5	5–18	Facebook secret group	No	2

(continued)

#	Title	Authors	Virtual model	Discussion modality	n of group(s)	n per group	Platform name	Mixed methods?	Moderator (n)
39	Opinions of youngsters with congenital Below-Elbow deficiency, and those of their parents and professionals concerning prosthetic use and rehabilitation treatment	Vasluian et al., 2013	Asynchronous	Chat group	5	25	Unknown	No	2
40	Speech-language pathologists' informal learning in healthcare settings: Behaviors and motivations	Walden & Bryan, 2011	Asynchronous	Chat group	1	4	phpBB	Yes	1

Note: [1]Includes the synchronous delivery of videoconferencing with a face-to-face component. [2]Developed by the Netherlands Institute for Health Services Research (NIVEL). [3]Research platform provided by Cancer Council Victoria website.